

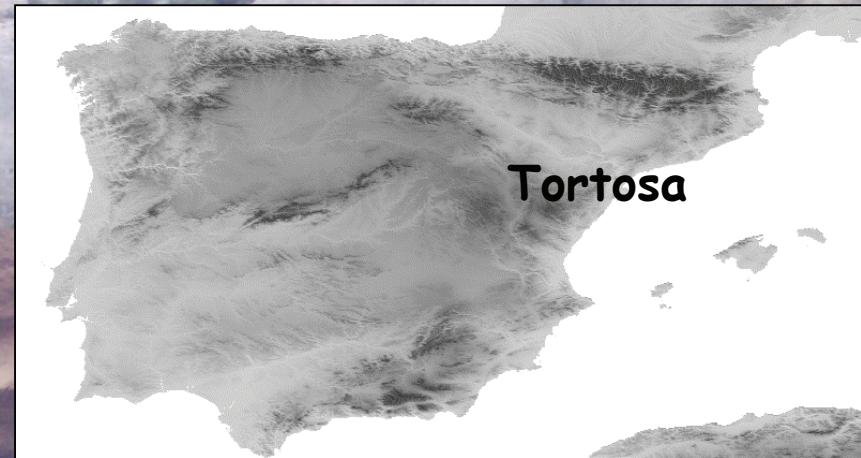
POTENTIAL FOR AIR PRESSURE AND CLIMATE DATA RESCUE FROM THE SOURCES HELD AT THE LIBRARY OF EBRO'S OBSERVATORY

Dr. Manola Brunet, Climate Change Research Group, URV, Tarragona, Spain

WMO AOPC/OOPC Surface Pressure Working Group, 3rd Meeting, Met Office,
Exeter, UK

"Trafalgar Day" 21st October 2005

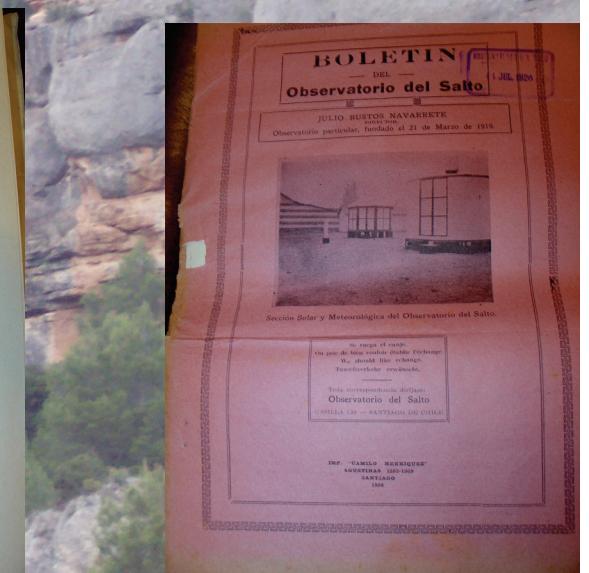
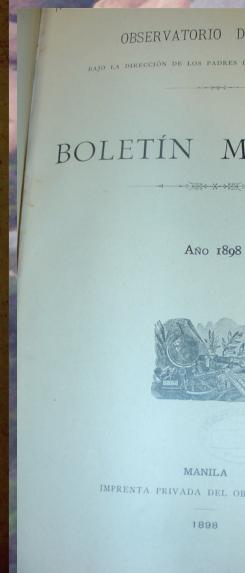
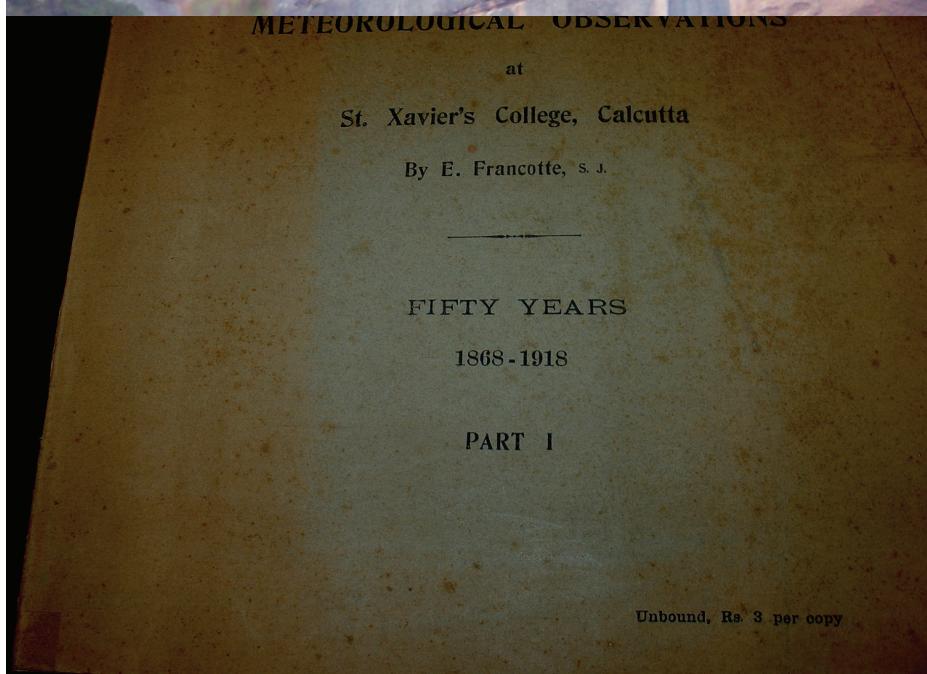
The Ebro's Observatory and Jesuits Company



- Jesuits Company and Ebro Observatory at the beginning: The Jesus College in Tortosa (1880-1903)
 - Magnetic and Meteorological obs.
- Setting officially up in Roquetas (Tortosa, Spain) in 1904 operated by Jesuits up to 1994
- Since 1995 a Catalonian research centre
- The library:
 - Periodic publications' exchange among other Jesuit Observatories around the world

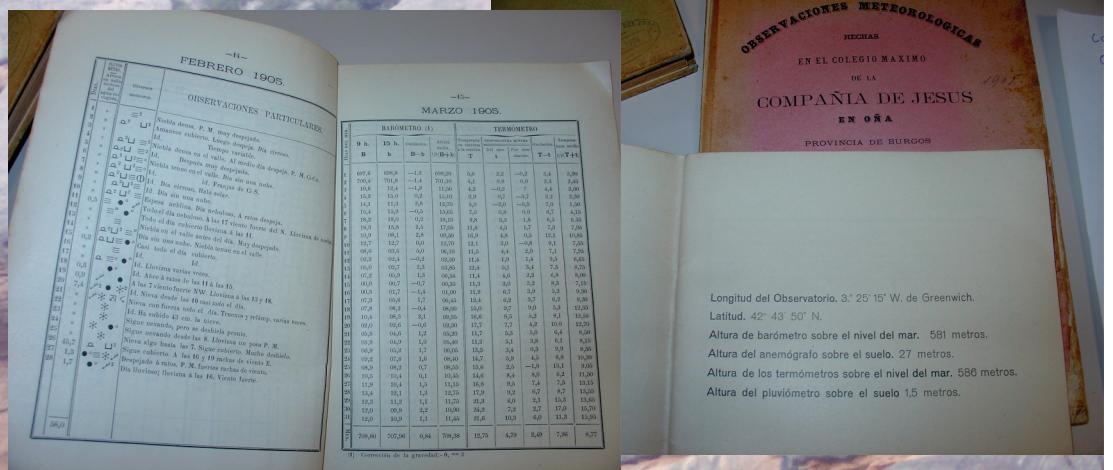
Data and metadata sources held at the Library

- Meteorological collections:
 - Monthly Bulletins
 - Annual Reports
- Meteorological monographs
- Observatories reports



POTENTIAL CLIMATE DATA AND METADATA TO BE RESCUED

- Both climate data and metadata are held at the Ebro's Library
- Data time scale:
 - Sub-daily: from 2 to 10 hourly obs/day
 - Daily
 - Monthly
- Periods: Different records' length depending on observatories or networks, but mostly for the 2nd half of the 19th century and the 20th century
- Variables: air pressure, wind, temperature, precipitation, relative humidity, water vapour pressure, cloudiness, sunshine, evaporation

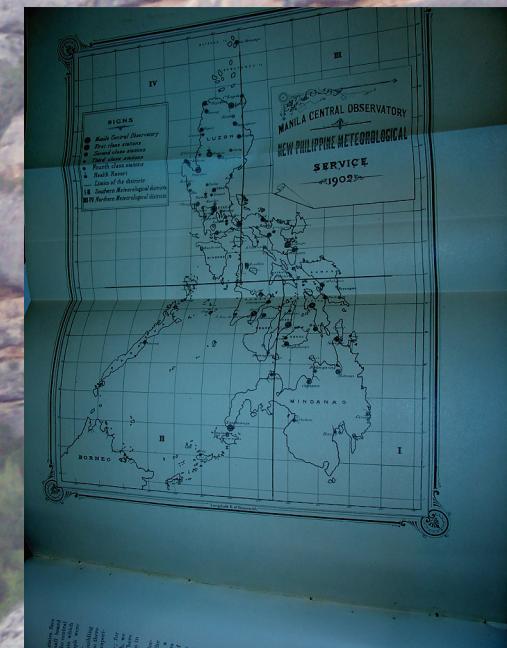
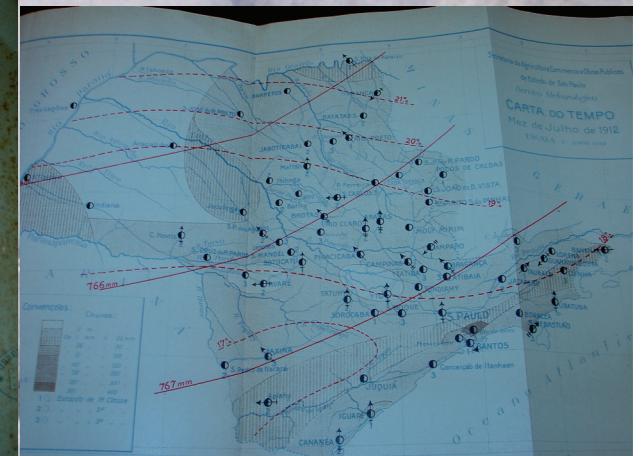
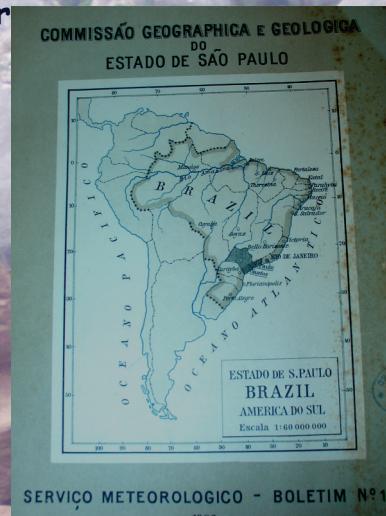


Longitud del Observatorio, 3° 25' 15" W. de Greenwich.
Latitud, 42° 43' 50" N.
Altura de barómetro sobre el nivel del mar, 581 metros.
Altura del anemógrafo sobre el suelo, 27 metros.
Altura de los termómetros sobre el nivel del mar, 586 metros.
Altura del pluviómetro sobre el suelo, 1,5 metros.

| Day | PRESSURE IN BAGUIO (BENGUET) DURING THE MONTH | | | | | | | | | | | | Table X | | | | | | | | | | | | | |
|-----|---|---------|---------|------|--------|----------|--------|----------|---------|----------|--------|----------|---------|----------|---------|----------|---------|----------|---------|----------|--------|----------|--------|----------|---------|----------|
| | PROBABLE INSTRUMENTAL CORRECTION +1.3mm = 0.054 INCH. | | | | | | | | | | | | | | | | | | | | | | | | | |
| | m. n. | hrs | 4 a.m. | hrs | 6 a.m. | hrs | 8 a.m. | hrs | 10 a.m. | hrs | noon | hrs | 2 p. m. | hrs | 4 p. m. | hrs | 6 p. m. | hrs | 8 p. m. | hrs | Mean | Extremum | Minim. | Maxim. | Suscep- | tion |
| 1 | 94.2.28 | 25.325 | 43.3.22 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 2 | 43.33 | 25.325 | 43.3.22 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 3 | 43.75 | 24.349 | 43.3.22 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 4 | 43.60 | 25.325 | 43.3.22 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 5 | 43.40 | 33.31 | 22.75 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 6 | 43.20 | 25.325 | 43.3.22 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 7 | 43.20 | 27.34 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 8 | 43.20 | 28.74 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 9 | 43.20 | 28.74 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 10 | 43.20 | 28.74 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 11 | 43.20 | 28.74 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 12 | 44.47 | 26.41 | 21.1.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 13 | 43.45 | 29.3.25 | 42.2.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 14 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 15 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 16 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 17 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 18 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 19 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 20 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 21 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 22 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 23 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 24 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 25 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 26 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 27 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 28 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 29 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 30 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3.29 | 25.320 | 343.3.28 | 25.315 | 343.3.27 | 25.310 | 343.3.26 | 25.305 | 343.3.25 | 25.300 | 343.3.24 | 25.295 | 343.3.23 |
| 31 | 43.59 | 25.0.25 | 41.5.25 | 2.25 | 325 | 343.3.35 | 25.320 | 343.3.32 | 25.335 | 343.3.31 | 25.330 | 343.3.30 | 25.325 | 343.3. | | | | | | | | | | | | |

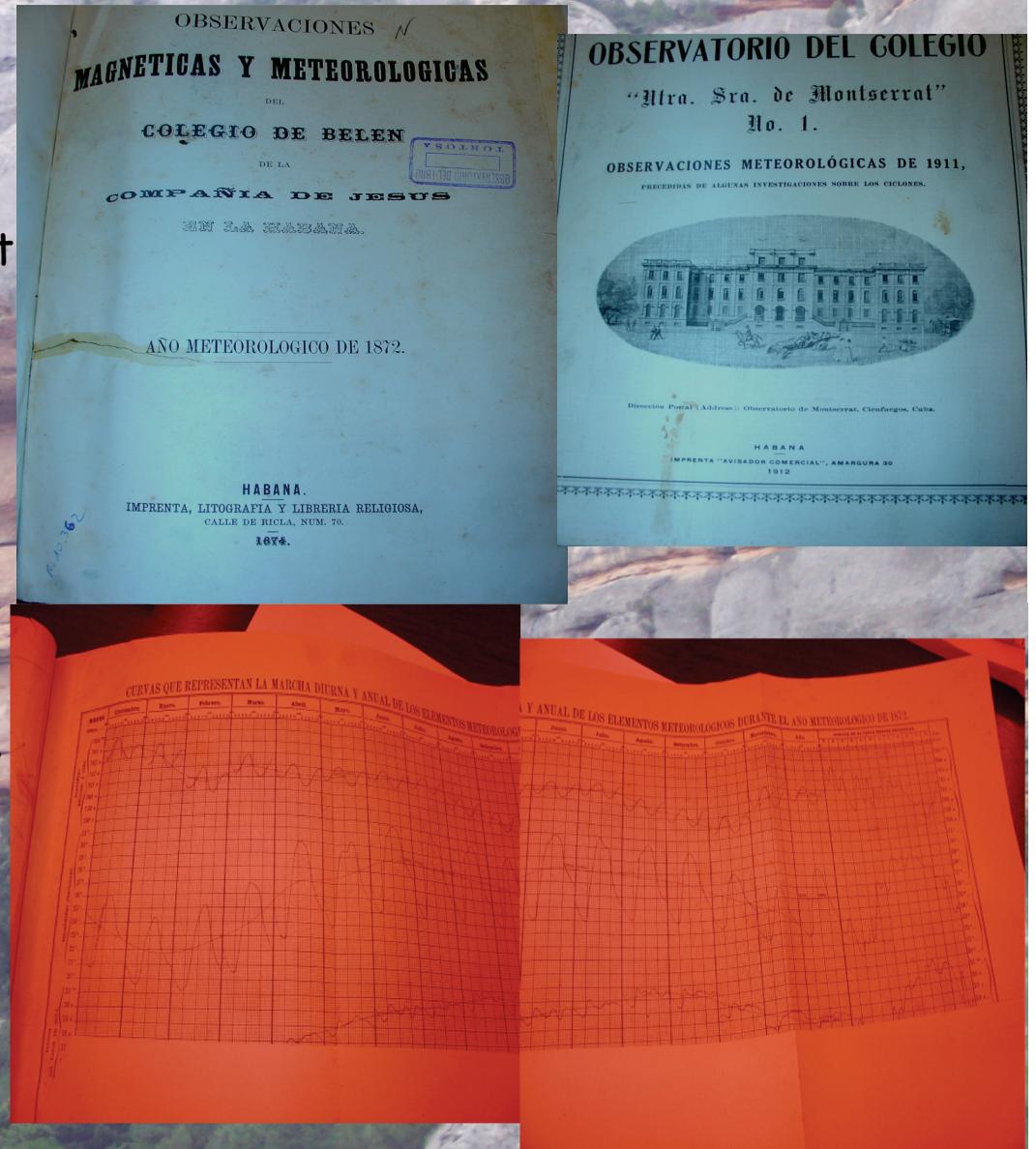
Preliminary inventory of data by networks and observatories

- Networks and observatories over America:
 - Brazil: 40 years of daily data for 41 stations (1906-1946) and 10 years of monthly data for 22 stations
 - Cuba (La Havana and Cienfuegos): 65 years of daily data(1871-1925)
 - Chile (El Salto and Punta Arenas): 52 years of monthly data (1888-1940)
 - Colombia (St. Bartolomé de Bogotá and Bogotá): 35 years of daily data (1923-25)
- Over Asia:
 - Philippines: 54 years of daily data for 29 observatories (1886-1940)
 - China (Zi-Ka-Wei): 56 years of daily data (1880-1936)
 - India (Calcuta): 50 years of daily data (1868-1918)
- Over Africa:
 - Madagascar: Antannarive (34 years of daily data: 1924-1958) and Andohalo(15 years of monthly data: 1864-1878/1887-88)
 - Mozambique (Boroma): 1833
- Over the Next Eastern:
 - Lebanon: (Ksara), 62 years of daily data (1910-1972)
- Over Europe:
 - Spain: Oña (14 years daily data: 1905-19), Orduña (48 years daily data: 1883-1931), Tortosa (25 years daily data: 1880-1905)
 - Malta: Gozo daily data for 1882
- About 3100 years of data. Near 1.132.000 daily values and 3.400.000 hourly values to be recovered/digitised



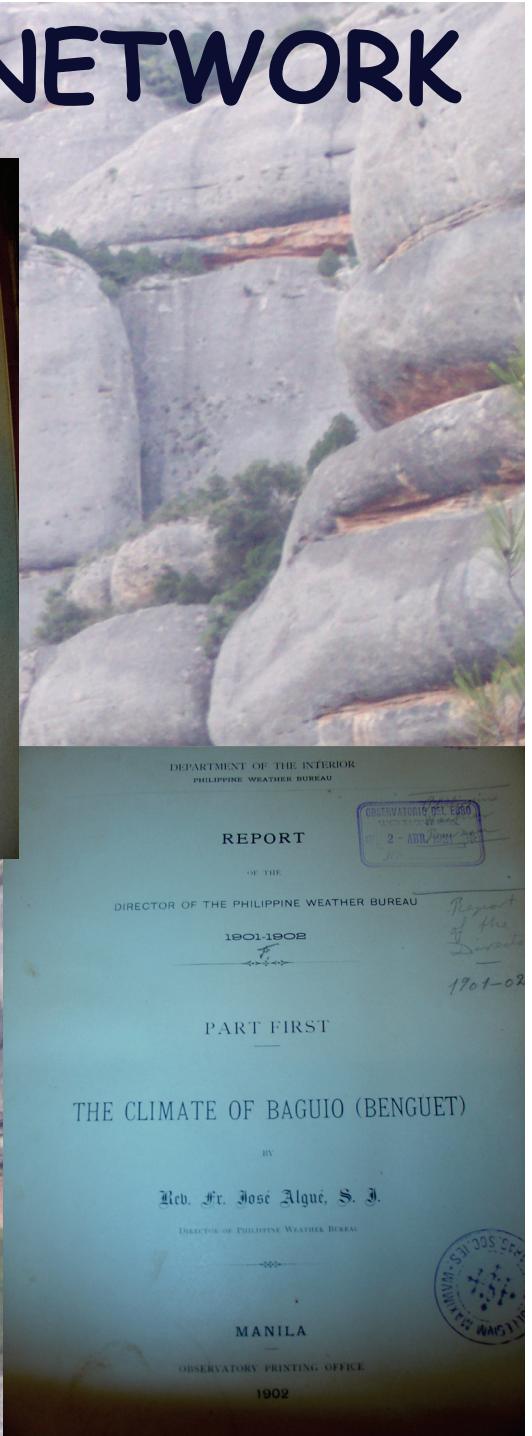
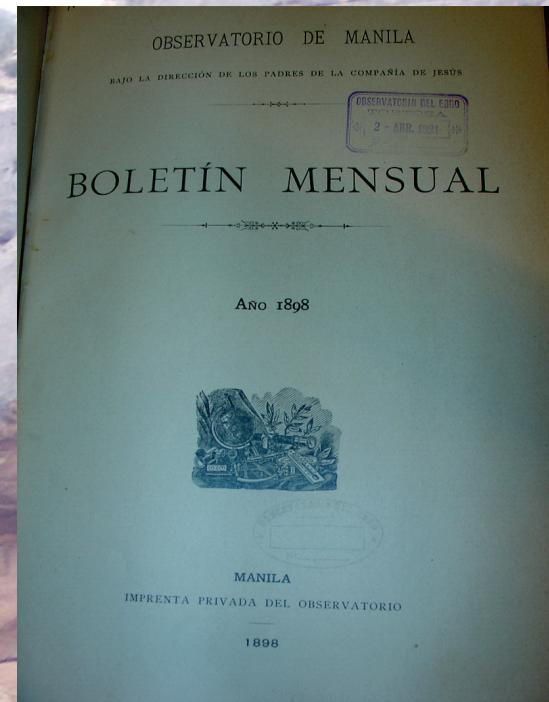
DETAILS OF SOME SELECTED STATIONS. I CUBA

- Jesuit observatories in Cuba:
 - Belen College in La Havana
 - Nuestra Señora de Montserrat in Cienfuegos
- Variables:
 - air pressure, temperature, water vapour pressure, relative humidity, wind, evaporation, precipitation, cloudiness
- Time scales:
 - Daily and sub-daily (two hourly obs/day)
- Periods:
 - Belen College: (1871-1925)
 - Nuestra Señora de Montserrat: (1911-1922)



II. PHILIPPINES JESUIT NETWORK

- Observatories in Philippines:
 - 30 stations: Manila, Baguio, Dagupan, Albay, Tabaco, Daet, Atimonan, Tayabas, Punta Santiago, San Isidro, Cabo Bolinao, Bayombong, Vigan, Tuguegarao, Laoag, Aparri, Magalang, Iloílo, Carlota, Mamburao, Calbayog, Surigao, Dapitan, Davao, Polloc, Mati, Joló, Luis de Apra, Vapor Argos
- Variables:
 - air pressure, temperature, relative humidity, fog, wind, precipitation, cloudiness
- Time scales:
 - Daily and sub-daily (up to 10 hourly obs/day)
- Periods:
 - Jesuit era (1886-1900)
 - Philippine Weather Bureau (1901-1940)
- Abundant metadata:
observers, locations, instrumental, units, etc.



II. MONTHLY BULLETINS OF MANILA'S OBSERVATORY IN LATE 19TH CENTURY: MAGALANG STATION

AÑO XXXIV

APÉNDICE

OBSERVACIONES VERIFICADAS EN DISTINTOS PUNTOS.

MAGALANG (Estación Agronómica.) Altitud 33 m. Lat. 15° 14' N. Long. 127° E. de S. Fernando. Observador, D. Joaquín Martínez.

| Días | Barómetro corregido 700 mm. + | | Temperatura del aire á la sombra | | Humedad relativa | | Tensión del vapor en mm. | | Temperatu- ras extremas | | Viento Dirección y fuerza 1 a 12 | | Partes del cielo cubiertas Forma de las nubes y su dirección | | | | Lluvia mm. | Meteores observados durante el dia | | | |
|------|----------------------------------|------|--|------|---------------------|------|--------------------------------|------|----------------------------|------|--|------|---|------|-------|------|---------------|--|------|--------|------|
| | | | 10 a. | | 4 p. | | 10 a. | | 4 p. | | 10 a. | | 4 p. | | 10 a. | | | | | | |
| | | | 10 a. | 4 p. | 10 a. | 4 p. | 10 a. | 4 p. | Máx. | Min. | 10 a. | 4 p. | 10 a. | 4 p. | 10 a. | 4 p. | | | | | |
| 1 | 58.9 | 58.0 | 29.5 | 29.0 | 68 | 65 | 20.8 | 19.2 | 30.5 | 21.0 | E | 3 | 5 | Ak | NE | 4 | Ks | E | 15.2 | Llz. □ | |
| 2 | 58.8 | 57.8 | 25.5 | 28.0 | 89 | 82 | 21.4 | 22.8 | 29.5 | 21.0 | NE | 1 | 9 | Kn | NE | 8 | Kn | NE | 2.1 | ● Llz. | |
| 3 | 58.7 | 57.2 | 28.5 | 29.5 | 74 | 85 | 21.4 | 23.8 | 31.0 | 21.0 | NE | 2 | NE | 3 | 7 | Kn | E | 8 | Kn | NE | 9.7 |
| 4 | 59.2 | 57.5 | 29.0 | 29.0 | 68 | 71 | 20.2 | 21.2 | 30.0 | 21.0 | N | 2 | 2 | 7 | Ks | NE | 7 | Ks | NE | 4.8 | |
| 5 | 59.8 | 57.8 | 29.0 | 29.5 | 68 | 68 | 20.2 | 20.8 | 30.5 | 21.0 | N | 2 | 2 | 7 | Ks | E | 6 | Kn | E | | |
| 6 | 60.5 | 58.1 | 27.5 | 29.0 | 77 | 71 | 21.0 | 21.2 | 30.0 | 20.5 | N | 2 | 2 | 7 | Ak | N | 8 | Kn | N | | |
| 7 | 60.3 | 58.5 | 28.0 | 28.5 | 74 | 71 | 20.8 | 20.4 | 30.0 | 20.5 | N | 1 | NE | 2 | 8 | Kn | NE | 8 | Kn | NE | |
| 8 | 60.9 | 59.7 | 27.0 | 28.5 | 77 | 74 | 20.8 | 21.8 | 29.5 | 19.0 | NN | 2 | 2 | 6 | Kn | E | 9 | Kn | NE | | |
| 9 | 61.1 | 60.0 | 27.5 | 28.0 | 74 | 78 | 16.6 | 15.6 | 28.5 | 18.5 | N | 3 | NE | 2 | 5 | Ks | NE | 6 | Ks | NE | |
| 10 | 61.6 | 59.7 | 26.0 | 27.0 | 63 | 59 | 16.4 | 17.2 | 30.0 | 19.5 | N | 2 | N | 3 | 5 | Ks | SE | 7 | Kn | E | |
| 11 | 61.0 | 58.5 | 25.0 | 28.0 | 66 | 63 | 21.6 | 21.8 | 30.0 | 19.5 | N | 2 | NE | 2 | 6 | Ks | E | 8 | Kn | SE | |
| 12 | 60.1 | 58.1 | 27.0 | 28.0 | 69 | 78 | 19.0 | 21.8 | 30.0 | 19.5 | E | 2 | E | 3 | 7 | Kn | E | 7 | Kn | SE | 34.7 |
| 13 | 59.2 | 56.9 | 26.5 | 28.5 | 85 | 71 | 21.6 | 20.4 | 30.0 | 21.5 | E | 2 | N | 2 | 7 | Kn | E | 7 | Kn | E | |
| 14 | 58.8 | 56.9 | 27.5 | 28.5 | 74 | 71 | 20.8 | 20.4 | 30.5 | 21.0 | NE | 2 | N | 2 | 5 | Kn | NE | 7 | Kn | E | |
| 15 | 58.7 | 56.5 | 28.0 | 29.5 | 74 | 65 | 20.8 | 20.4 | 32.0 | 19.5 | N | 3 | N | 3 | 5 | Kn | NE | 4 | Kn | NE | |
| 16 | 59.2 | 56.9 | 27.5 | 28.5 | 78 | 75 | 21.8 | 22.2 | 31.5 | 20.5 | N | 3 | E | 3 | 4 | Ks | SE | 4 | Ks | SE | |
| 17 | 59.9 | 57.8 | 27.5 | 28.5 | 74 | 64 | 21.4 | 18.4 | 31.5 | 19.0 | E | 2 | SE | 3 | 7 | Kn | E | 6 | Ks | SE | |
| 18 | 60.5 | 58.3 | 28.5 | 29.0 | 71 | 68 | 21.2 | 20.8 | 32.0 | 21.0 | N | 3 | NE | 3 | 7 | Kn | E | 6 | Kn | E | |
| 19 | 61.0 | 58.3 | 26.5 | 28.0 | 77 | 71 | 19.8 | 20.6 | 30.5 | 19.5 | N | 2 | E | 2 | 5 | Ks | SE | 8 | Kn | E | |
| 20 | 60.2 | 58.0 | 27.0 | 28.5 | 63 | 64 | 17.2 | 18.4 | 30.5 | 18.5 | E | 2 | E | 2 | 7 | Cs | E | 7 | Kn | E | |
| 21 | 60.6 | 59.2 | 25.0 | 28.0 | 73 | 64 | 18.2 | 17.8 | 29.5 | 18.5 | E | 2 | E | 3 | 5 | Ks | E | 7 | Ak | NE | |
| 22 | 60.7 | 58.9 | 28.0 | 28.5 | 64 | 64 | 18.6 | 17.8 | 30.0 | 18.5 | N | 2 | N | 3 | 6 | Ks | E | 8 | Kn | NE | |
| 23 | 60.0 | 58.2 | 29.0 | 29.5 | 59 | 60 | 18.4 | 19.8 | 32.0 | 18.5 | N | 2 | N | 3 | 4 | S | N | 7 | Kn | N | |
| 24 | 58.9 | 56.6 | 27.5 | 27.5 | 69 | 64 | 17.2 | 17.8 | 29.0 | 18.0 | N | 3 | SE | 4 | 4 | Ks | N | 7 | Kn | SE | |
| 25 | 58.8 | 56.1 | 23.5 | 27.5 | 64 | 60 | 14.0 | 16.2 | 29.5 | 18.0 | N | 3 | E | 4 | 4 | Cs | N | 7 | Kn | E | |
| 26 | 62.1 | 59.8 | 23.5 | 24.0 | 53 | 60 | 11.6 | 13.2 | 27.5 | 14.0 | NE | 3 | NE | 3 | 3 | S | E | 3 | Ks | N | |
| 27 | 62.7 | 60.3 | 23.0 | 27.0 | 68 | 53 | 15.0 | 14.0 | 29.5 | 12.5 | NE | 3 | E | 3 | 5 | Ks | NE | 7 | Kn | NE | |
| 28 | 61.9 | 59.8 | 25.0 | 26.0 | 58 | 62 | 14.0 | 15.4 | 29.5 | 14.0 | E | 3 | E | 3 | 7 | Kn | NE | 8 | Kn | NE | |
| 29 | 61.2 | 59.2 | 27.5 | 28.0 | 51 | 57 | 14.2 | 16.0 | 29.5 | 16.0 | E | 3 | E | 3 | 8 | Kn | NE | 9 | Kn | E | |
| 30 | 60.2 | 58.6 | 27.5 | 28.0 | 60 | 60 | 16.2 | 16.8 | 29.5 | 17.0 | N | 2 | N | 2 | 8 | Kn | NE | 9 | Kn | E | |
| 31 | 59.7 | 58.0 | 27.0 | 28.0 | 67 | 71 | 18.2 | 19.8 | 30.5 | 17.5 | N | 2 | Calma | o | 8 | Kn | E | 9 | Kn | NE | |
| Med. | 60.2 | 58.2 | 26.9 | 28.2 | 69.3 | 67.4 | 18.7 | 19.1 | 30.1 | 18.9 | | 2.3 | | 2.7 | 6.0 | | 6.9 | | 66.5 | | |

II. FATHER JOSE ALGUER's REPORT: AIR PRESSURE DAILY DATA FOR SEPTEMBER 1901

— 11 —

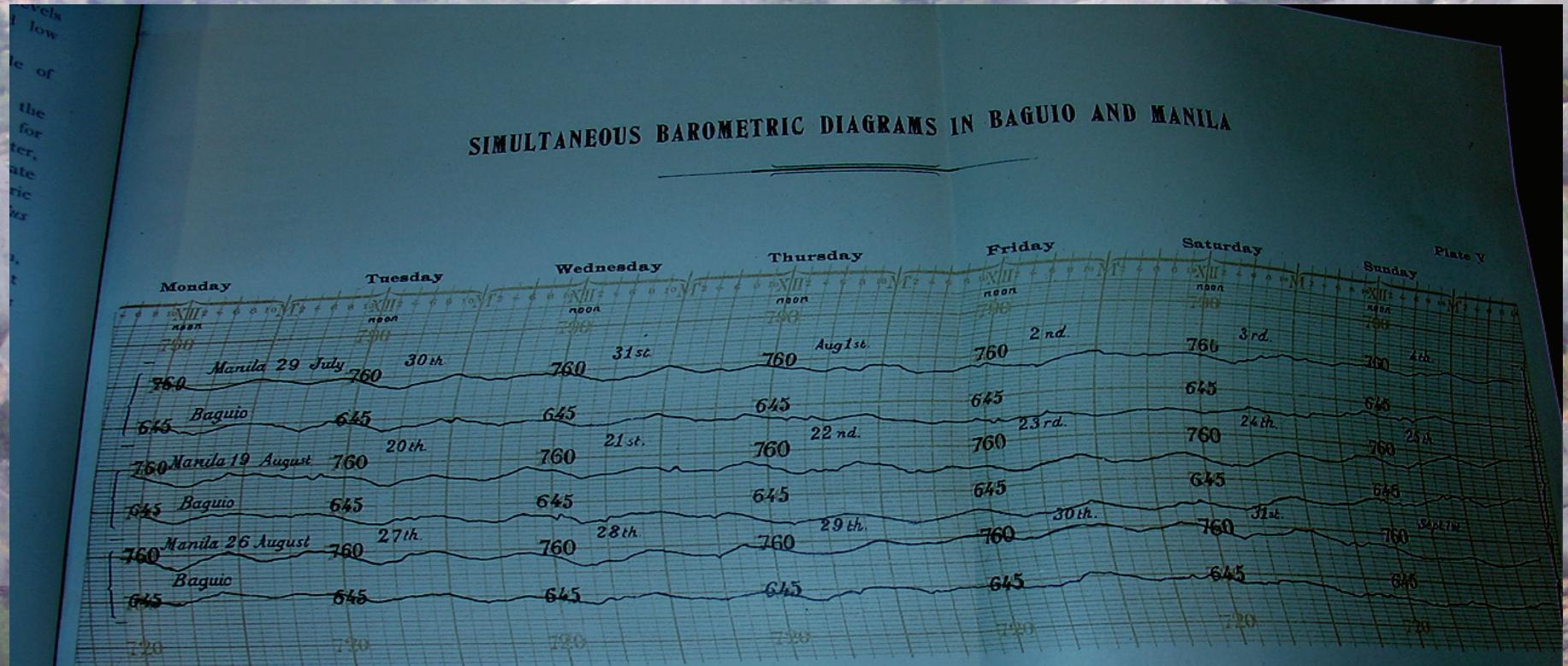
MEAN DAILY PRESSURE REDUCED TO SEA LEVEL IN BAGUIO, DAGUPAN AND MANILA

1901

Table III

| Day | SEPTEMBER | | | | | | | Remarks |
|-----|--------------------|---------------------|--------------------|----------|----------|----------|----------------------|----------------|
| | 1 Baguio mm. | 2 Dagupan mm. | 3 Manila mm. | △ 1-2 | △ 2-3 | △ 1-3 | | |
| 1 | 755.54 | 755.57 | 756.05 | -0.03 | -0.48 | -0.51 | Area of low pressure | NE. of Manila |
| 2 | 55.40 | 55.23 | 55.49 | 0.17 | -0.26 | -0.09 | do | do do |
| 3 | 56.43 | 56.47 | 56.60 | -0.04 | -0.13 | -0.17 | do | do do |
| 4 | 56.72 | 56.65 | 57.00 | 0.07 | -0.35 | -0.28 | do | NNE. do |
| 5 | 56.60 | 56.71 | 57.24 | -0.11 | -0.53 | -0.64 | do | N. do |
| 6 | 57.21 | 57.56 | 58.16 | -0.35 | -0.60 | -0.95 | do | N. do |
| 7 | 57.69 | 58.02 | 58.25 | -0.33 | -0.23 | -0.56 | do | N. do |
| 8 | 57.06 | 57.42 | 57.51 | -0.36 | -0.09 | -0.45 | do | N. do |
| 9 | 57.02 | 57.48 | 57.61 | -0.46 | -0.13 | -0.59 | do | N. and SE. do |
| 10 | 56.92 | 57.32 | 57.53 | -0.40 | -0.21 | -0.61 | do | N. and ESE. do |
| 11 | 56.73 | 57.00 | 57.26 | -0.27 | -0.26 | -0.53 | do | N. and E. do |
| 12 | 57.00 | 57.22 | 57.32 | -0.22 | -0.10 | -0.32 | do | ENE. do |
| 13 | 57.16 | 56.79 | 57.07 | 0.37 | -0.28 | 0.09 | do | do do |
| 14 | 56.55 | 55.26 | 56.41 | 1.29 | -1.15 | 0.14 | do | NE. do |
| 15 | 56.17 | 55.85 | 55.92 | 0.32 | -0.07 | 0.25 | Typhoon to the | NE. do |
| 16 | 55.56 | 55.20 | 55.54 | 0.36 | -0.34 | 0.02 | do | NNE. do |
| 17 | 56.34 | 56.35 | 56.63 | -0.01 | -0.28 | -0.29 | do | N. by E. do |
| 18 | 57.24 | 57.62 | 57.71 | -0.38 | -0.08 | -0.69 | | |

II. BAROMETRIC DIAGRAMS FOR MANILA AND BAGUIO (PHILIPPINES). AUGUST 1901



III. 19TH CENTURY JESUIT OBSERVATIONS AT ST. XAVIER'S COLLEGE, CALCUTTA, INDIA (1868-1918)

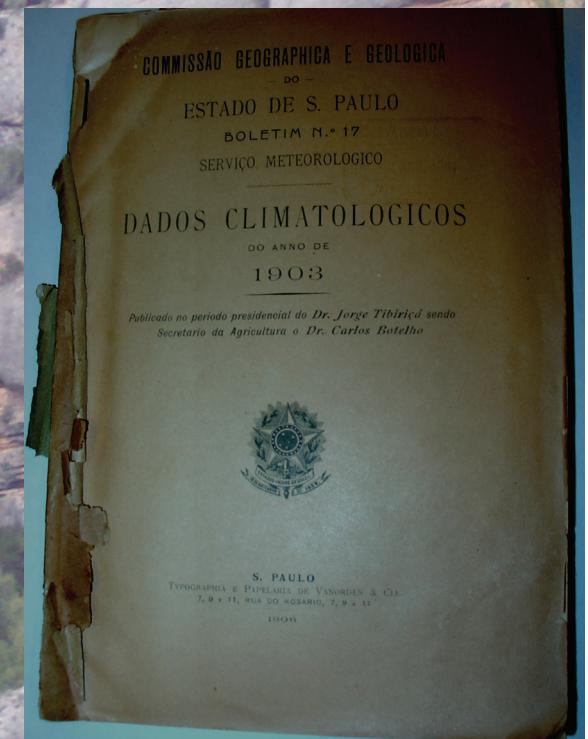
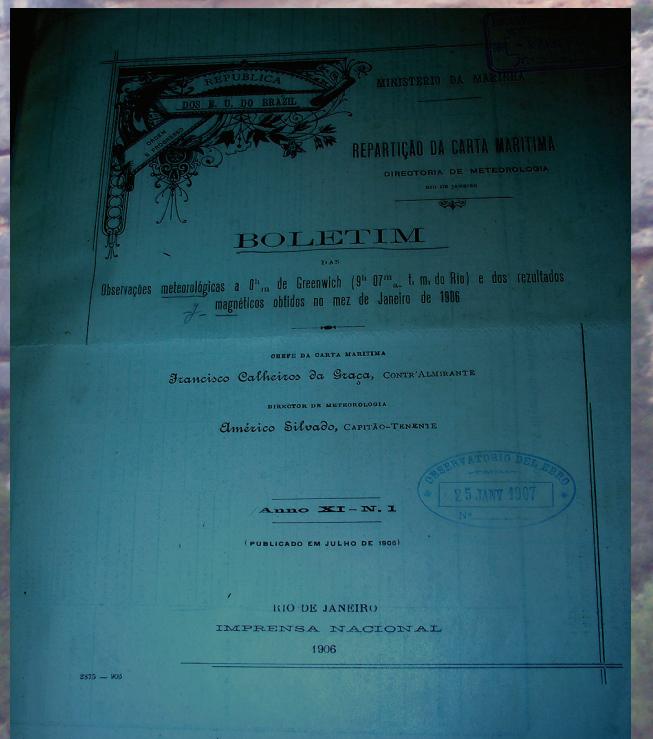
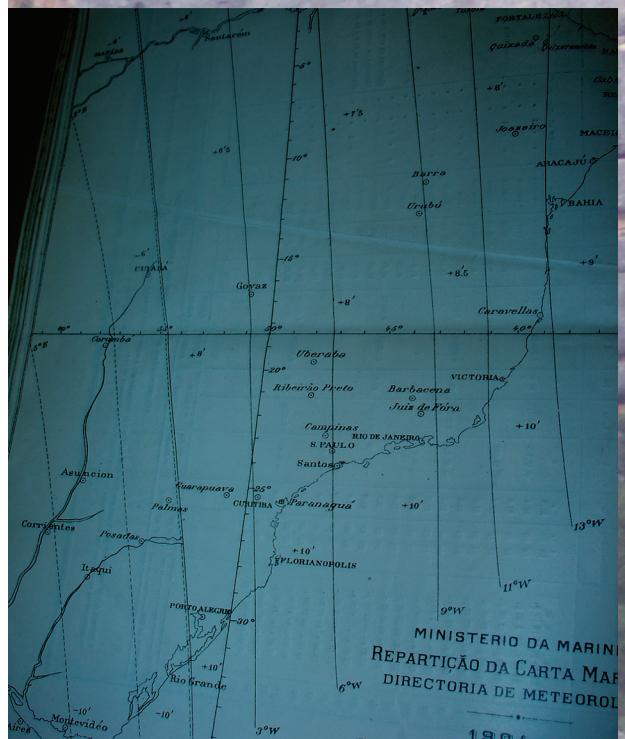
- Observational place: St. Xavier's College in Calcutta, India.
- Variables: air pressure, temperature, wind, relative humidity, precipitation
- Time scale: daily
- Period: 1868-1918
- Some metadata available

| ST. XAVIER'S COLLEGE OBSERVATORY CALCUTTA | | | | | | | | | | | | JANUARY 1868 | | | | | | | | | | | | JANUARY 1869 | | | | | | | | | | | |
|--|-------------------|--------|-----------------|-------|---------------|--------|---------------------------------|----------|----------------------------|---------------------|--|---|-------------|--------|-----------------|-------|-------------------|--------|---------------------------------|----------|----------------------------|---------------------|--|---|-------------------|--------|-----------------|-------|---------------|--------|---------------------------------|----------|----------------------------|---------------------|--|
| Date | TEMPERATURE (°F.) | | | | WIND | | | | TEMPERATURE (°F.) | | | | WIND | | | | TEMPERATURE (°F.) | | | | WIND | | | | TEMPERATURE (°F.) | | | | WIND | | | | | | |
| | Mean of day | Maxima | Solar radiation | Shade | Range (Shade) | Minima | Mean Barom. corrected 29 inches | Residual | Velocity in miles per hour | Resultant direction | Relative humidity (Barometric reduction = 100) | Total Rainfall (Fall in night to next morning) inches | Mean of day | Maxima | Solar radiation | Shade | Range (Shade) | Minima | Mean Barom. corrected 29 inches | Residual | Velocity in miles per hour | Resultant direction | Relative humidity (Barometric reduction = 100) | Total Rainfall (Fall in night to next morning) inches | Mean of day | Maxima | Solar radiation | Shade | Range (Shade) | Minima | Mean Barom. corrected 29 inches | Residual | Velocity in miles per hour | Resultant direction | Relative humidity (Barometric reduction = 100) |
| 1 | 64.8 | 74.0 | 17.8 | 56.2 | | 1-116 | N by W | | 77 | | | | 1 | 66.1 | 75.2 | 19.0 | 56.2 | | 1-092 | W SW | 34 | 68 | | | 1 | 66.1 | 75.2 | 19.0 | 56.2 | | 1-092 | W SW | 34 | 68 | |
| 2 | 64.3 | 74.1 | 17.4 | 56.7 | | 1-120 | N | | 75 | | | | 2 | 67.8 | 77.2 | 20.0 | 57.2 | | 1-122 | W | 37 | 70 | | | 2 | 67.8 | 77.2 | 20.0 | 57.2 | | 1-122 | W | 37 | 70 | |
| 3 | 62.0 | 72.2 | 19.3 | 52.9 | | 1-083 | N | | 70 | | | | 3 | 69.4 | 77.8 | 19.6 | 58.2 | | 1-139 | N NE | 35 | 85 | x | | 3 | 69.4 | 77.8 | 19.6 | 58.2 | | 1-139 | N NE | 35 | 85 | x |
| 4 | 65.6 | 75.4 | 19.9 | 55.5 | | 1-045 | W | | 66 | | | | 4 | 71.7 | 79.0 | 15.5 | 63.5 | | 1-105 | E SE | 54 | 73 | | | 4 | 71.7 | 79.0 | 15.5 | 63.5 | | 1-105 | E SE | 54 | 73 | |
| 5 | 67.9 | 77.5 | 19.7 | 56.8 | | 1-005 | W by N | | 79 | | | | 5 | 71.7 | 80.0 | 14.2 | 65.8 | | 1-051 | N NE | 69 | 75 | | | 5 | 71.7 | 80.0 | 14.2 | 65.8 | | 1-051 | N NE | 69 | 75 | |
| 6 | 70.7 | 79.8 | 18.9 | 62.9 | | 0-992 | W | | 82 | | | | 6 | 68.7 | 78.0 | 20.6 | 57.4 | | 1-125 | N NW | 72 | 67 | | | 6 | 68.7 | 78.0 | 20.6 | 57.4 | | 1-125 | N NW | 72 | 67 | |
| 7 | 72.2 | 79.9 | 14.4 | 65.5 | | 1-008 | W by S | | 72 | | | | 7 | 68.6 | 77.4 | 18.4 | 59.0 | | 1-129 | N by E | 28 | 65 | | | 7 | 68.6 | 77.4 | 18.4 | 59.0 | | 1-129 | N by E | 28 | 65 | |
| 8 | 69.9 | 76.5 | 12.1 | 64.4 | | 1-038 | N | | 57 | | | | 8 | 67.7 | 77.0 | 18.5 | 58.5 | | 1-109 | NE | 37 | 69 | | | 8 | 67.7 | 77.0 | 18.5 | 58.5 | | 1-109 | NE | 37 | 69 | |
| 9 | 66.6 | 75.6 | 17.9 | 57.7 | | 1-003 | NE | | 56 | | | | 9 | 67.8 | 76.4 | 18.1 | 58.3 | | 1-108 | N by W | 27 | 66 | | | 9 | 67.8 | 76.4 | 18.1 | 58.3 | | 1-108 | N by W | 27 | 66 | |
| 10 | 66.0 | 74.9 | 17.6 | 57.3 | | 1-027 | N by E | | 57 | | | | 10 | 67.5 | 77.0 | 20.0 | 57.0 | | 1-116 | N NE | 35 | 64 | | | 10 | 67.5 | 77.0 | 20.0 | 57.0 | | 1-116 | N NE | 35 | 64 | |
| 11 | 65.7 | 75.0 | 20.5 | 54.5 | | 1-085 | N by W | | 60 | | | | 11 | 68.9 | 79.5 | 21.2 | 58.3 | | 1-134 | E NE | 35 | 64 | | | 11 | 68.9 | 79.5 | 21.2 | 58.3 | | 1-134 | E NE | 35 | 64 | |
| 12 | 66.9 | 76.0 | 19.1 | 56.9 | | 1-089 | N by E | | 64 | | | | 12 | 68.8 | 79.2 | 21.7 | 57.5 | | 1-123 | S SE | 37 | 75 | | | 12 | 68.8 | 79.2 | 21.7 | 57.5 | | 1-123 | S SE | 37 | 75 | |
| 13 | 69.9 | 77.2 | 17.0 | 60.2 | | 1-110 | N by E | | 71 | | | | 13 | 71.5 | 81.2 | 20.2 | 61.0 | | 1-102 | E SE | 41 | 70 | | | 13 | 71.5 | 81.2 | 20.2 | 61.0 | | 1-102 | E SE | 41 | 70 | |
| 14 | 69.4 | 78.1 | 16.6 | 61.5 | | 1-111 | N by E | | 66 | | | | 14 | 74.2 | 82.2 | 15.7 | 66.5 | | 1-154 | N by E | 52 | 70 | | | 14 | 74.2 | 82.2 | 15.7 | 66.5 | | 1-154 | N by E | 52 | 70 | |
| 15 | 67.5 | 76.3 | 17.0 | 59.3 | | 1-115 | N by E | | 59 | | | | 15 | 70.3 | 79.7 | 17.9 | 61.8 | | 1-213 | N NW | 138 | 51 | | | 15 | 70.3 | 79.7 | 17.9 | 61.8 | | 1-213 | N NW | 138 | 51 | |
| 16 | 67.4 | 76.2 | 17.9 | 58.3 | | 1-076 | N | | 63 | | | | 16 | 68.2 | 77.9 | 20.4 | 57.5 | | 1-140 | NW | 77 | 51 | | | 16 | 68.2 | 77.9 | 20.4 | 57.5 | | 1-140 | NW | 77 | 51 | |
| 17 | 67.3 | 76.3 | 17.8 | 58.5 | | 1-010 | N by W | | 64 | | | | 17 | 68.5 | 77.9 | 19.2 | 58.7 | | 1-088 | NW | 51 | 54 | | | 17 | 68.5 | 77.9 | 19.2 | 58.7 | | 1-088 | NW | 51 | 54 | |
| 18 | 67.4 | 76.8 | 18.6 | 58.2 | | 1-013 | NW by N | | 62 | | | | 18 | 69.6 | 79.4 | 20.0 | 59.4 | | 1-052 | W | 52 | 55 | | | 18 | 69.6 | 79.4 | 20.0 | 59.4 | | 1-052 | W | 52 | 55 | |
| 19 | 68.7 | 78.2 | 19.3 | 58.9 | | 1-039 | N by W | | 64 | | | | 19 | 70.0 | 79.9 | 19.3 | 60.6 | | 1-075 | W | 35 | 52 | | | 19 | 70.0 | 79.9 | 19.3 | 60.6 | | 1-075 | W | 35 | 52 | |
| 20 | 68.6 | 77.6 | 17.5 | 60.1 | | 1-080 | NE | | 66 | | | | 20 | 70.7 | 81.4 | 22.1 | 59.3 | | 1-109 | W SW | 14 | 59 | | | 20 | 70.7 | 81.4 | 22.1 | 59.3 | | 1-109 | W SW | 14 | 59 | |
| 21 | 67.2 | 76.6 | 19.2 | 57.4 | | 1-075 | NE by N | | 62 | | | | 21 | 71.6 | 82.4 | 21.7 | 60.7 | | 1-067 | W SW | 28 | 73 | | | 21 | 71.6 | 82.4 | 21.7 | 60.7 | | 1-067 | W SW | 28 | 73 | |
| 22 | 68.3 | 78.1 | 20.1 | 58.0 | | 1-031 | N by E | | 65 | | | | 22 | 73.8 | 85.0 | 20.5 | 64.5 | | 0-992 | S SW | 120 | 68 | | | 22 | 73.8 | 85.0 | 20.5 | 64.5 | | 0-992 | S SW | 120 | 68 | |
| 23 | 70.3 | 79.8 | 20.3 | 59.5 | 0-938 | N by W | | 59 | | | | 23 | 75.7 | 85.8 | 19.3 | 66.5 | | 0-934 | SW | 103 | 61 | | | 23 | 75.7 | 85.8 | 19.3 | 66.5 | | 0-934 | SW | 103 | 61 | | |
| 24 | 70.6 | 79.1 | 16.5 | 62.6 | 0-991 | N by E | | 63 | | | | 24 | 76.5 | 87.3 | 19.0 | 68.3 | | 0-916 | S SW | 132 | 66 | | | 24 | 76.5 | 87.3 | 19.0 | 68.3 | | 0-916 | S SW | 132 | 66 | | |
| 25 | 70.9 | 80.2 | 18.6 | 61.6 | 1-045 | NE | | 65 | | | | 25 | 73.1 | 80.8 | 15.0 | 65.8 | | 0-994 | N NE | 147 | 56 | | | 25 | 73.1 | 80.8 | 15.0 | 65.8 | | 0-994 | N NE | 147 | 56 | | |
| 26 | 70.3 | 79.3 | 17.8 | 61.5 | 1-036 | NE | | 59 | | | | 26 | 73.9 | 83.2 | 18.4 | 64.8 | | 1-005 | N by E | 48 | 66 | | | 26 | 73.9 | 83.2 | 18.4 | 64.8 | | 1-005 | N by E | 48 | 66 | | |
| 27 | 71.4 | 80.3 | 17.3 | 63.0 | 0-982 | N by E | | 64 | | | | 27 | 75.5 | 83.9 | 15.5 | 68.4 | | 1-013 | N NW | 28 | 69 | | | 27 | 75.5 | 83.9 | 15.5 | 68.4 | | 1-013 | N NW | 28 | 69 | | |
| 28 | 73.3 | 81.4 | 15.2 | 66.2 | 0-944 | NW | | 72 | | | | 28 | 69.2 | 73.0 | 18.4 | 64.3 | | 0-952 | S SW | 88 | 80 | | | 28 | 69.2 | 73.0 | 18.4 | 64.3 | | 0-952 | S SW | 88 | 80 | | |
| 29 | 71.2 | 79.4 | 15.3 | 64.1 | 1-027 | N by E | | 66 | | | | 29 | 73.4 | 82.7 | 18.4 | 64.3 | | 0-960 | NE | 75 | 68 | 0-13 | | 29 | 73.4 | 82.7 | 18.4 | 64.3 | | 0-960 | NE | 75 | 68 | 0-13 | |
| 30 | 70.0 | 80.1 | 19.1 | 61.0 | 1-008 | N NE | | 64 | | | | 30 | 74.1 | 79.8 | 10.4 | 69.4 | | 0-974 | SW | 47 | 79 | | | 30 | 74.1 | 79.8 | 10.4 | 69.4 | | 0-974 | SW | 47 | 79 | | |
| 31 | 66.1 | 72.1 | 11.1 | 61.0 | 1-001 | NW | | 83 | 0.03 | | | 31 | 74.9 | 82.9 | 14.6 | 67.4 | | | | | | | | 31 | 74.9 | 82.9 | 14.6 | 67.4 | | | | | | | |
| Monthly means | F° | F° | F° | F° | F° | ins. | Mil. | | Total ins. | F° | F° | F° | F° | ins. | Mil. | | | | | | | | | | | | | | | | | | | | |
| | 68.36 | 77.23 | 17.6 | 59.62 | 1-040 | N by E | Kil. | 66.2% | 0.03 | F° | F° | F° | F° | 0.03 | 0.03 | | | | | | | | | | | | | | | | | | | | |
| | C° | C° | C° | C° | C° | mms. | | mmms. | | F° | F° | F° | F° | | | | | | | | | | | | | | | | | | | | | | |
| | 20.20 | 25.13 | 9.8 | 15.84 | 763.0 | | | 0.76 | | F° | F° | F° | F° | | | | | | | | | | | | | | | | | | | | | | |

* Observations of the wind velocity were started in 1869, and those of Solar and night radiation, only in 1870.

IV. THE BRAZILIAN AND THE SAO PAULO STATE NETWORKS

- The Brazilian Meteorological Bulletin:
 - daily data for 41 stations and for the period 1906-1946
- The Sao Paulo State network:
 - monthly data for 22 stations and for 1902-1912
- Variables:
 - air pressure, temperature, relative humidity, water vapour pressure, cloudiness, precipitation, wind



IV. MONTHLY CLIMATE DATA FOR 22 STATIONS IN SAO PAULO STATE FOR DECEMBER 1902

⁽⁴⁾ Também ocorreu no dia 12.



SUGGESTING AND PRIORITISING DATA RECOVERY AND DIGITISATION EFFORTS

- Philippine station of Manila and Zi-Ka-Wey in China will be probably digitised by the staff of the Ebro's Library (if the submitted national research proposal succeed)
- Calcutta air pressure and temperature records could be digitised by CCRG, throughout voluntary work, if it was of some interest
- Other suggestions...